

REMARKS

The courtesies extended to the undersigned by the Examiner, Sameh Tawfik, during the interview held August 22, 2007 are acknowledged and appreciated. Applicants, their principal representatives in Germany, and the undersigned have carefully reviewed the first Office Action on the merits of July 10, 2007 in the subject U.S. patent application, together with the prior art cited and relied on by the Examiner in the rejections of the claims. In response, the claims of the application have been amended to more clearly define the subject invention over the prior art cited and relied upon by the Examiner in the rejection of the claims. The differences between the claimed subject matter and the prior art were discussed in detail during the interview. It is believed that the claims now pending in the subject application are patentable over the prior art cited and relied on, taken either singly or in combination. Reexamination and reconsideration of the application, and allowance of the claims is respectfully requested.

As set forth in the Substitute Specification, as depicted particularly in Figs. 4-6 of the drawings, and as recited in the currently amended claims, the subject invention is directed to a folding apparatus. As may be seen in Fig. 4, a spur cylinder 8 cooperates with a folding jaw cylinder 02 to transversely fold previously cut signatures 16. In Fig. 4, a signature 16 is engaged, at its leading end, by spur needles of a spur strip 11. This engagement retains the signature 16 on the surface of the spur cylinder 18 until the signature 18 is transversely folded.

Such folding is accomplished by the cooperation of a folding blade 22 on the spur cylinder 18, and a folding jaw 06 on the folding jaw cylinder 02.

Referring now to Fig. 5, which is a depiction of the folding apparatus at a point in time subsequent to its depiction in Fig. 4, it will be seen that the signature 16 has been gripped, intermediate its ends, by the folding jaw 06 and is now transversely folded. The leading end of the now folded signature has been released from its spur strip 11. As the folding jaw cylinder 07 rotates in a clockwise direction, as seen in Figs. 4 and 5, the leading end of the first, now folded signature 16 is pulled along the surface of the spur cylinder 18 in a retrograde or reverse movement direction, opposite to the counterclockwise direction of rotation of the spur cylinder 18. As seen in Fig. 5, the leading end of the now folded signature would engage and move opposite to the direction of movement of the subsequent spur strip 08. Such movement could damage the end of the now transversely folded signature.

In accordance with the present invention, as described in detail in at least paragraphs 020, 021 and 022 of the Substitute Specification, and as recited in currently amended claim 17, the spur cylinder 18 is provided with deflectors 21, 22 and 23. These deflectors, as recited in paragraph 020 are each strip-shaped sheet metal pieces which each has an inclined face 24. Again referring to Fig. 5, the face 24 of the deflector 22 is shown as covering its associate spur strip 08. The result of this coverage of the spur strip 08 by the inclined face 24 of the deflector

strip is that, as seen most clearly in Fig. 6, the once leading end of the now transversely folded signature 16 can move in a direction opposite to the direction of rotation of the spur cylinder 18 while not running the risk of being engaged by the spur needles carried by the spur strip 08. This is because, as set forth at paragraphs 021 and 022 of the Substitute Specification, the deflector 22, in covering the spur needles 08, with its inclined deflector face 24, is shielding the previously leading end section of the first signature 16 from the spur needles of the subsequent spur strip 08.

As is also depicted in the drawings, described in the Substitute Specification and recited in the currently pending claims, the deflector strip face 24 covers the spur strip only within an angular range as identified in Fig. 4 at α and as described in the Substitute Specification as an angle of 30°-60°, with respect to a center line 26 that extends between the spur cylinder 18 and the folding jaw cylinder 02. At other times during the rotation of the spur cylinder, the deflectors 21, 22 and 23 are retracted so that their associated spur strip spur needles are exposed. Note spur strips 9 and 11, and deflectors 21 and 23 in this regard.

In the Office Action of July 10, 2007, the drawings were objected to as failing to show the features of the subject invention recited in dependent claim 21. In response, that claim has been cancelled. The cancellation of claim 21 is believed to render the objections to the drawings moot.

The specification was objected to because of the inclusion of the word "in" at the end of each drawing figure's description. In accordance with the Examiner's request, those terms have been cancelled.

A review of the Substitute Specification, during the preparation of the subject Amendment, noted several minor typographical errors, punctuation omissions and instances of inapt phrasing. These minor errors have been corrected. Such corrections do not add any new matter. Their entry is respectfully requested.

Claims 17-29, all of the claims then pending in the application, were rejected under 35 USC 103(a) as being unpatentable over U.S. patent No. 6,843,763 to Jackson in view of U.S. patent No. 4,445,881 to Bullen. It was asserted that Jackson discloses the claimed folding apparatus, as depicted in Fig. 2, with the exception of the deflector on the spur cylinder and the means for moving such a deflector. It was further asserted that Bullen discloses a similar folding apparatus and teaches the use of deflectors which extend radially outwardly beyond the cylinder, as seen in Fig. 3 at 38. It was thus asserted that it would be obvious to modify the Jackson folder, by use of the Bullen deflector to lift a web section off a cylinder to avoid a jam.

As discussed with Examiner Tawfik during the interview of August 22, 2007, and for the reasons set forth below, it is believed that a device resulting from the combination of Jackson and Bullen, assuming that such a combination would be appropriate, does not render obvious

the folding apparatus recited in currently amended independent claim 17. The reasons in support of this conclusion are set forth hereinafter.

In the Jackson patent, there is shown a folding cylinder. As may be seen in Fig. 2, there is depicted a jaw folder 30 which includes a transfer cylinder 34, a cutting cylinder 32 and a jaw cylinder 36. A printed web 100 is cut into signatures 102 as it passes between the cutting cylinder 32 and the transfer cylinder 34. The leading end of each newly created signature 102 is impaled by pins 50 so that each signature is carried around to the now aligned jaw 48 of the jaw cylinder 36. At this point, the tucker or folding blade 46 transversely folds the signature 102 in cooperation with the folding pair 48. As admitted in the Office Action, Jackson does not disclose, or suggest the provision of a deflector or any means to move such a deflector.

The secondary reference to Bullen is directed to a device for improved newspaper folding and cutting mechanisms. It shows essentially the first two cylinders of the Jackson jaw folder. Bullen shows a cutting cylinder 14, equivalent to the cutting cylinder 32 of Jackson. It also shows a folding cylinder 16 which is the equivalent of the transfer cylinder 34 of Jackson. In Bullen, the signatures, which are produced in collect production, as will be discussed below, are transversely folded by the cooperation of a folding blade 30 with a pair of folding rollers 18. Fig. 1 of Bullen shows the position of carrier pins 20, 22 and 24 spaced on the surface of the folding cylinder 16. As may be seen in Fig. 1, the pins 24 are situated just after, on the surface

of the folding cylinder 16, the point at which a cutting blade 28 transversely cuts the printed web 10 to form a trailing end of a first signature and a leading end of a second signature.

Referring to Fig. 3 of Bullen, the carrier pins 24 are not depicted on the surface of the folding cylinder 16, as they were in Fig. 1. However, it will be understood that such pins 24 would, in fact be located just above the resilient cutting pad 34 with which the cutting blade 28 is cooperating.

As discussed with Examiner Tawfik during the interview, and as described in detail in the Bullen reference, when a folding jaw cylinder is operating in collect productions, an inside web section is first collected on the folding cylinder. Its leading end is cut and is gripped by a set of pins 20, 22 or 24. This is seen at the upper left third of the folding cylinder in Fig. 1. The folding cylinder continues in its rotation until a second, outside section is placed on top of the previously cut inside section. Once the inside section and the outside section have been "collected" on the folding cylinder 16, the trailing end of the outside section is cut, as depicted in Fig. 3, and the collected signature is cross-folded by the folding blade 30.

The placement of the inside section on the folding cylinder 16 effectively increases the radius, and thus the circumference of the cylinder. The result is that as the trailing end of a now added outside section is cut, the cutting blade will also be apt to cut off a portion of the trailing end of the inner section.

Bullen attempts to solve this problem by the provision of spaced apart rollers 38. These rollers are usable to increase the effective radius of the folding cylinder 16, as discussed at the top of Column 3 of the Bullen reference. Such increase in the cylinder radius, by movement of the rollers 38 is done "...just prior to cutting the trailing edge of the outside section." Note Column 3, lines 4 and 5. Also note the discussion of Bullen at Column 3, lines 18-20 where the radial movement of the rollers 38, to expand the effective radius of the folding cylinder 16 and to lift the inside section off the cylinder surface, is discussed.

In an alternate embodiment of the Bullen invention, as seen in Figs. 4 and 5, the surface of the folding cylinder 16 is provided with bands 60. These bands 60 can be caused to bow outwardly, thus increasing the effective diameter of the folding cylinder, as the trailing end of the outside section of the web 10 is about to be cut. The result is again the same, as depicted in Fig. 3.

Several substantial differences exist between the subject invention, as recited in currently amended claim 17, and a device which would result for the combination of the Jackson and Bullen references. Initially, the roller 38 of Bullen is extended radially at the time the web is cut by the blade 28. It would thus also be located at the same places in a Jackson/Bullen combination. In claim 17 of the subject application, there is recited a spur cylinder, equivalent to the transfer cylinder 34 of Jackson, and a folding jaw cylinder, equivalent

to the jaw cylinder 36 of Jackson. Claim 17 recites that these two cylinders define a transfer gap. That gap is defined as a transfer gap because it is where the signatures are transferred from the spur cylinder to the folding jaw cylinder. An equivalent transfer gap in Jackson would be diametrically opposite the point at which the Jackson cutting cylinder 32 cooperates with the transfer cylinder 34. The transfer gap of Jackson is where the signatures are transferred from the transfer cylinder 34 to the jaw cylinder 36.

Claim 17 of the subject application recites a deflector on the spur cylinder and usable selectively to cover and to expose the spur needles. That deflector has a deflector strip which can be retracted into the spur cylinder to expose the spur needles and can be extended from the spur cylinder to cover the spur needles. Claim 17 further recites that the deflector strip is in its retracted, spur needle exposing position during passage of the spur needles through the transfer gap and is moved to the extended spur needle covering position subsequent to passage of the spur needles and the deflector through the transfer gap.

In the Bullen device, the rollers 38 are extended just prior to the cutting of the trailing end of an outside section of a signature, as clearly depicted in Fig. 3, and as described in Column 3, lines 1-5. If the Bullen rollers 38 were combined with the Jackson device, they would be located at the point where the cutting cylinder 32 engages the transfer cylinder. That point is not the transfer gap of the Jackson device. As discussed above, the Jackson transfer gap is

diametrically opposite to that point where the Bullen roller 38 would be located. The combination of Jackson and Bullen does not render obvious the folding assembly of the subject invention, as recited in currently amended claim 17 for this reason.

The roller 38 of Bullen is not extended and retracted to expose or to cover the pins 20, 22 or 24 of the folding cylinder 16. The roller 38 is extended to increase the effective radius of the folding cylinder 16. It is located on the opposite side of each resilient cutting pad 34 from the next adjacent set of pins. There is no teaching or suggestion that the Bullen roller 38 is provided for any other purpose than to briefly expand the folding cylinder radius at the point where the cutting blade 28 acts the trailing end of the outside section of the signature.

Combining the Bullen roller 38 with the Jackson device does not change the location or function of the roller 38. It would still be located at the point of such cutting. It would still function to briefly expand the effective radius of the folding cylinder 16. It would not extend or retract to cover or to expose spur needles subsequent to passage of the spur needles through the transfer gap. In fact, Bullen recites that "...just prior to the engagement of the blade 28 with the outside section and the resilient pad 34, the effective radius of the cutting drum is expanded." Note Column 2, lines 50-54. As seen in Fig. 3, the roller 38 is moved radially outwardly as it passes through the cutting gap defined between the cutting cylinder 14 and the folding cylinder 16. Again, the Bullen roller 38 is actuated at a different location to perform a different function.

Its inclusion in the Jackson device would not change the location of its actuation or the function that it performs.

With respect to the rejection of claim 18, as discussed above, the transfer gap in the subject invention is the location at which the signatures are transferred from the spur cylinder 18 to the folding jaw cylinder 02. This transfer gap is indicated at 03 in the drawings of the subject application. In the Bullen device a similar transfer gap, if any, would be the location where the folding blade 30 delivers the signatures to the fold rollers 18. The assertion that there is some type of transfer gap between the cylinder 16 and its associated cam 46 is not correct.

With respect to claim 26, the Bullen reference uses a cylindrical roller to lift a trailing end of an inner section of a signature off the surface of the folding cylinder 16. A roller does not have an inclined face, as that term is described and depicted in the subject application.

The rejection of claim 21 over Jackson and Bullen and further in view of U.S. patent No. 2,775,171 to Steen is noted. Since claim 21 has been cancelled, that rejection is believed to be moot.

The various other references cited by the Examiner in the Office Action of July 10, 2007, have been noted. Since they were not relied on in the rejections of the claims, no further discussion thereof is believed to be required.

SUMMARY

The Substitute Specification has been amended to correct various minor informalities without the addition of any new matter.

Claims 17, 19, 20, 22, 25, 26, 27 and 29 have been amended. Claims 18, 21 and 24 have been cancelled. Claims 23 and 28 have been carried forward. As discussed with the Examiner on August 22, 2007, it is believed that the claims now pending in the subject application are patentable over the prior art cited and relied on, taken either singly or in combination. Allowance of these claims, and passage of the application to issue is respectfully requested.

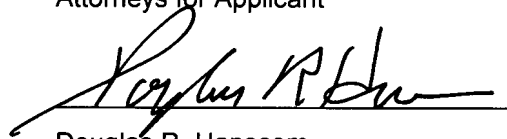
Respectfully submitted,

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A handwritten signature in black ink, appearing to read 'Douglas R. Hanscom', is written over a horizontal line.

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